

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>WO 24660</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/EP 99/04625</b>	International filing date (day/month/year) <b>02/07/1999</b>	(Earliest) Priority Date (day/month/year)
Applicant <b>NOKIA NETWORKS OY</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

## 4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

## 5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

## 6. The figure of the drawings to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1

☐ None of the figures.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 99/04625

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04L29/06 H04Q7/38

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04L H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 280 085 A (VODAFONE LTD) 18 January 1995 (1995-01-18) abstract page 2, line 1 - line 20 page 3, line 5 - page 4, line 11 page 11, line 12 - page 12, line 21 -----	1-18
A	WO 95 32592 A (REININGHAUS GEORG ; SIEMENS AG (DE)) 30 November 1995 (1995-11-30) abstract page 3, line 4 - line 33 page 7, line 5 - line 17 page 7, line 34 - page 8, line 18 -----	1-18

☐ Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

## \* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

Date of the actual completion of the international search

11 May 2000

Date of mailing of the international search report

18/05/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Adkhts, F

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 99/04625

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
GB 2280085	A	18-01-1995	AU	6978494 A	17-01-1995
			WO	9501069 A	05-01-1995
WO 9532592	A	30-11-1995	DE	4417779 C	07-12-1995
			CN	1152990 A	25-06-1997
			EP	0760192 A	05-03-1997
			JP	2971948 B	08-11-1999
			JP	9508772 T	02-09-1997
			US	5898922 A	27-04-1999

PCT

NOTICE INFORMING THE APPLICANT OF THE  
COMMUNICATION OF THE INTERNATIONAL  
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To:

TRÖSCH, Hans-Ludwig  
Tiedtke-Bühling-Kinne et al.Bavariaring 4  
D-80336 München  
ALLEMAGNE  
EINGEGANGEN  
Patentanwälte

19. Jan. 2001

TIEDTKE · BÜHLING · KINNE  
& PARTNER (GbR)

Date of mailing (day/month/year) 11 January 2001 (11.01.01)		
Applicant's or agent's file reference WO 24660		IMPORTANT NOTICE
International application No. PCT/EP99/04625	International filing date (day/month/year) 02 July 1999 (02.07.99)	Priority date (day/month/year)
Applicant NOKIA COMMUNICATIONS OY et al		

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:  
AU,KP,KR,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE,AL,AM,AP,AT,AZ,BA,BB,BG,BR,BY,CA,CH,CN,CU,CZ,DE,DK,EA,EE,EP,ES,FI,GB,GD,GE,GH,  
GM,HR,HU,ID,IL,IN,IS,JP,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MD,MG,MK,MN,MW,MX,NO,NZ,OA,  
PL,PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,UA,UG,UZ,VN,YU,ZA,ZW

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on  
11 January 2001 (11.01.01) under No. WO 01/03402

**REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)**

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

**REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))**

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer J. Zahra Telephone No. (41-22) 338.83.38
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## PATENT COOPERATION TREATY

EINGEGANGEN

20.09.1999

PCT

From the INTERNATIONAL BUREAU

To:

TRÖSCH, Hans-Ludwig  
Tiedtke-Bühling-Kinne et al.  
Bavariaring 4  
D-80336 München  
ALLEMAGNE

NOTIFICATION OF RECEIPT OF  
RECORD COPY

(PCT Rule 24.2(a))

Date of mailing (day/month/year) 13 September 1999 (13.09.99)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference WO 24660	International application No. PCT/EP99/04625

The applicant is hereby notified that the International Bureau has received the record copy of the international application as detailed below.

Name(s) of the applicant(s) and State(s) for which they are applicants:

NOKIA TELECOMMUNICATIONS OY (for all designated States except US)  
VITIKAINEN, Timo (for US)

International filing date : 02 July 1999 (02.07.99)  
Priority date(s) claimed :  
Date of receipt of the record copy  
by the International Bureau : 17 August 1999 (17.08.99)  
List of designated Offices :

AP : GH,GM,KE,LS,MW,SD,SL,SZ,UG,ZW  
EA : AM,AZ,BY,KG,KZ,MD,RU,TJ,TM  
EP : AT,BE,CH,CY,DE,DK,ES,FI,FR,GB,GR,IE,IT,LU,MC,NL,PT,SE  
OA : BF,BJ,CF,CG,CI,CM,GA,GN,GW,ML,MR,NE,SN,TD,TG  
National : AE,AL,AM,AT,AU,AZ,BA,BB,BG,BR,BY,CA,CH,CN,CU,CZ,DE,DK,EE,ES,FI,GB,GD,GE,  
GH,GM,HR,HU,ID,IL,IN,IS,JP,KE,KG,KP,KR,KZ,LC,LK,LR,LS,LT,LU,LV,MD,MG,MK,MN,MW,MX,  
NO,NZ,PL,PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,UA,UG,US,UZ,V,VU,ZA,ZW

## ATTENTION

The applicant should carefully check the data appearing in this Notification. In case of any discrepancy between these data and the indications in the international application, the applicant should immediately inform the International Bureau.

In addition, the applicant's attention is drawn to the information contained in the Annex, relating to:

- ☒ time limits for entry into the national phase  
☐ confirmation of precautionary designations  
☐ requirements regarding priority documents

A copy of this Notification is being sent to the receiving Office and to the International Searching Authority.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer: S. De Michiel Telephone No. (41-22) 338.83.38
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## INFORMATION ON TIME LIMITS FOR ENTERING THE NATIONAL PHASE

The applicant is reminded that the "national phase" must be entered before each of the designated Offices indicated in the Notification of Receipt of Record Copy (Form PCT/IB/301) by paying national fees and furnishing translations, as prescribed by the applicable national laws.

The time limit for performing these procedural acts is **20 MONTHS** from the priority date or, for those designated States which the applicant elects in a demand for international preliminary examination or in a later election, **30 MONTHS** from the priority date, provided that the election is made before the expiration of 19 months from the priority date. Some designated (or elected) Offices have fixed time limits which expire even later than 20 or 30 months from the priority date. In other Offices an extension of time or grace period, in some cases upon payment of an additional fee, is available.

In addition to these procedural acts, the applicant may also have to comply with other special requirements applicable in certain Offices. **It is the applicant's responsibility** to ensure that the necessary steps to enter the national phase are taken in a timely fashion. Most designated Offices do not issue reminders to applicants in connection with the entry into the national phase.

For detailed information about the procedural acts to be performed to enter the national phase before each designated Office, the applicable time limits and possible extensions of time or grace periods, and any other requirements, see the relevant Chapters of Volume II of the PCT Applicant's Guide. Information about the requirements for filing a demand for international preliminary examination is set out in Chapter IX of Volume I of the PCT Applicant's Guide.

GR and ES became bound by PCT Chapter II on 7 September 1996 and 6 September 1997, respectively, and may, therefore, be elected in a demand or a later election filed on or after 7 September 1996 and 6 September 1997, respectively, regardless of the filing date of the international application. (See second paragraph above.)

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

## CONFIRMATION OF PRECAUTIONARY DESIGNATIONS

This notification lists only specific designations made under Rule 4.9(a) in the request. It is important to check that these designations are correct. Errors in designations can be corrected where precautionary designations have been made under Rule 4.9(b). The applicant is hereby reminded that any precautionary designations may be confirmed according to Rule 4.9(c) before the expiration of 15 months from the priority date. If it is not confirmed, it will automatically be regarded as withdrawn by the applicant. There will be no reminder and no invitation. Confirmation of a designation consists of the filing of a notice specifying the designated State concerned (with an indication of the kind of protection or treatment desired) and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.

## REQUIREMENTS REGARDING PRIORITY DOCUMENTS

For applicants who have not yet complied with the requirements regarding priority documents, the following is recalled.

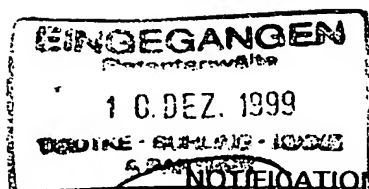
Where the priority of an earlier national, regional or international application is claimed, the applicant must submit a copy of the said earlier application, certified by the authority with which it was filed ("the priority document") to the receiving Office (which will transmit it to the International Bureau) or directly to the International Bureau, before the expiration of 16 months from the priority date, provided that any such priority document may still be submitted to the International Bureau before that date of international publication of the international application, in which case that document will be considered to have been received by the International Bureau on the last day of the 16-month time limit (Rule 17.1(a)).

Where the priority document is issued by the receiving Office, the applicant may, instead of submitting the priority document, request the receiving Office to prepare and transmit the priority document to the International Bureau. Such request must be made before the expiration of the 16-month time limit and may be subjected by the receiving Office to the payment of a fee (Rule 17.1(b)).

If the priority document concerned is not submitted to the International Bureau or if the request to the receiving Office to prepare and transmit the priority document has not been made (and the corresponding fee, if any, paid) within the applicable time limit indicated under the preceding paragraphs, any designated State may disregard the priority claim, provided that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity to furnish the priority document within a time limit which is reasonable under the circumstances.

Where several priorities are claimed, the priority date to be considered for the purposes of computing the 16-month time limit is the filing date of the earliest application whose priority is claimed.

## PATENT COOPERATION TREATY



PCT

NOTIFICATION OF THE RECORDING  
OF A CHANGE(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

TRÖSCH, Hans-Ludwig  
Tiedtke-Bühling-Kinne et al.  
Bavariaring 4  
D-80336 München  
ALLEMAGNE

Date of mailing (day/month/year) 06 December 1999 (06.12.99)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference WO 24660	
International application No. PCT/EP99/04625	International filing date (day/month/year) 02 July 1999 (02.07.99)

1. The following indications appeared on record concerning:

☒ the applicant    ☐ the inventor    ☐ the agent    ☐ the common representative

Name and Address NOKIA TELECOMMUNICATIONS OY Keilalahdentie 4 FIN-02150 Espoo Finland	State of Nationality FI	State of Residence FI
	Telephone No. +358 9 1807 0	
	Facsimile No. +358 9 1807 496	
	Teleprinter No.	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person    ☒ the name    ☐ the address    ☐ the nationality    ☐ the residence

Name and Address NOKIA NETWORKS OY Keilalahdentie 4 FIN-02150 Espoo Finland	State of Nationality FI	State of Residence FI
	Telephone No. +358 9 1807 0	
	Facsimile No. +358 9 1807 496	
	Teleprinter No.	

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

☒ the receiving Office    ☐ the designated Offices concerned  
☒ the International Searching Authority    ☐ the elected Offices concerned  
☐ the International Preliminary Examining Authority    ☐ other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer S. De Michiel
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.43.38

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

RECEIVED  
EINGEGANGEN

08. Okt. 2001

PCT

TBK - PATENT

To:

LESON, Thomas, Johannes, Alois  
TIEDTKE, BÜHLING, KINNE & PARTNER  
Bavariaring 4  
D-80336 München  
ALLEMAGNE

## NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Rule 71.1)

Date of mailing  
(day/month/year) 04.10.2001

Applicant's or agent's file reference  
WO 24660

### IMPORTANT NOTIFICATION

International application No.  
PCT/EP99/04625

International filing date (day/month/year)  
02/07/1999

Priority date (day/month/year)

Applicant  
NOKIA NETWORKS OY et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

#### 4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/

 European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized officer

Ahrens, R

Tel. +49 89 2399-8136





# PATENT COOPERATION TREATY

From the:  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

LESON, Thomas, Johannes, Alois  
TIEDTKE, BÜHLING, KINNE & PARTNER  
Bavariaring 4  
D-80336 München  
ALLEMAGNE

RECEIVED  
EINGEGANGEN

12. Juli 2001

TBK - PATENT

PCT

WRITTEN OPINION

(PCT Rule 66)

Date of mailing  
(day/month/year)

11.07.2001

Applicant's or agent's file reference

WO 24660

REPLY DUE

within 2 month(s)  
from the above date of mailing

International application No.

PCT/EP99/04625

International filing date (day/month/year)

02/07/1999

Priority date (day/month/year)

International Patent Classification (IPC) or both national classification and IPC

H04L29/06

Applicant

NOKIA NETWORKS OY et al.

1. This written opinion is the first drawn up by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain document cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.

**When?** See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

**How?** By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

**Also:** For an additional opportunity to submit amendments, see Rule 66.4.  
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.  
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is:

11.09.2001

Name and mailing address of the international preliminary examining authority:



European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized officer / Examiner

Cretaine, P

Formalities officer (incl. extension of time limits)

Barrio Baranano, A

Telephone No. +49 89 2399 8621



## WRITTEN OPINION

International application No. PCT/EP99/04625

### I. Basis of the opinion

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"*):

#### Description, pages:

1-12 as originally filed

#### Claims, No.:

1-18 as originally filed

#### Drawings, sheets:

1/2-2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

## WRITTEN OPINION

International application No. PCT/EP99/04625

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

### V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1
Inventive step (IS)	Claims	2-4, 11, 17, 18
Industrial applicability (IA)	Claims	

2. Citations and explanations  
**see separate sheet**

### VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:  
**see separate sheet**

### VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:  
**see separate sheet**

**Re Item V**

**Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Reference is made to the following documents:

D1 = GB-A-2 280 085

D2 = WO-A-95 32592

2. The broad and vague formulation of claim 1 (see also section VIII of this opinion) is such that its subject-matter could be read onto the prior art of a GSM standard system.
- For instance document D1 discloses (see from page 3, line 5 to page 4, line 11; page 11, lines 12 to 23), according to the essential features of claim 1 and using the wording of this claim, an authentication method for identifying a subscriber of a first network ("subscriber subscribing to the second cellular telephone system") in a second network ("main system"), comprising the steps of:
- allocating an address of said second network ("similar identification number") to said subscriber;
  - generating information about a mapping between the subscriber's address in said second network and a subscriber's identity ("such number...also identifying the subscriber", "IMSI", "MSISDN");
  - and transmitting the mapping to said second network ("each latter number being input into the main system").

Therefore claim 1 does not meet the requirement of Article 33(2) PCT.

Moreover, it should be noted that even if novelty of **claim 1** could be argued, based on minor differences between the features of this claim and those disclosed in **D1**, the subject-matter of **claim 1** would not involve an inventive step, Article 33(3) PCT, having regard to the disclosure of **D1**.

3. Independent claims 11 and 17 substantially correspond to claim 1, in terms of, respectively, a claim for a system and a claim for a gateway device. Although the

## PATENT COOPERATION TREATY

## PCT

RECEIVED  
EINGEGANGEN

08. Okt. 2001

TBK - PATENT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>WO 24660</b>	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/EP99/04625</b>	International filing date (day/month/year) <b>02/07/1999</b>	Priority date (day/month/year)
International Patent Classification (IPC) or national classification and IPC <b>H04L29/06</b>		
Applicant <b>NOKIA NETWORKS OY et al.</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 5 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  <b>09/01/2001</b>	Date of completion of this report  <b>04.10.2001</b>
Name and mailing address of the international preliminary examining authority:   <b>European Patent Office</b> <b>D-80298 Munich</b> <b>Tel. +49 89 2399 - 0 Tx: 523656 epmu d</b> <b>Fax: +49 89 2399 - 4465</b>	Authorized officer  <b>Cretaine, P</b>  Telephone No. <b>+49 89 2399 8828</b> 

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP99/04625

## I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, pages:**

1-12 as originally filed

**Claims, No.:**

1-17 as received on 11/09/2001 with letter of 11/09/2001

**Drawings, sheets:**

1/2,2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☒ the claims, Nos.: 17

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/EP99/04625

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims	1-17
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-17
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-17
	No:	Claims	

2. Citations and explanations  
**see separate sheet**

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:  
**see separate sheet**

**Re Item V**

**Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

The invention relates to an authentication method (claim 1) and system (claim 10) for identifying a subscriber of a first network in a second network. It also relates to a gateway device (claim 16) for connecting said first network to said second network.

**Prior art:**

GB-A-2 280 085 (= D1) discloses a method for enabling a subscriber to an AMPS network to be identified for roaming in a GSM network. The subscriber is provided with a temporary smartcard bearing an IMSI identifying the subscriber as visiting the GSM network but also as being registered within the AMPS network. If that subscriber activates his handset in the GSM network, the network recognises the subscriber as an AMPS subscriber and, via a communication link, extracts subscriber data from an HLR in the AMPS network and stores this in the VLR associated with the GSM network.

**Problem:**

D1 relates to the problem of identifying a mobile subscriber in a visited mobile network. The invention deals with the case of a mobile subscriber wishing to access a valued added service (VAS) provided by an IP network. Since, in the prior art, the VAS platform in the IP network only receives IP packets from a certain source address which is normally only a dynamic IP address of the mobile station, it does not have sufficient information for identifying that mobile station and performing charging.

**Invention:**

According to the features of independent claims 1 (method) and 10 (system), a mapping information between the address of the second network (IP) and the subscriber identity is generated and supplied to an authentication server of the VAS platform in the second network. Thereby, a client-server connection is achieved, which allows the actual subscriber identity of a dynamic address of the second network (IP) to be handled over to the second network. The second network uses the mapping of the



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/EP99/04625

address of the second network and the subscriber identity for identifying the subscriber, without having to query the HLR of the subscriber. Independent claim 16 relates to a gateway device for the first network comprising an authentication client means for generating the mapping and transmitting it to the second network.

The cited documents neither address the problem of VAS authentication nor suggest the claimed solution. Therefore claims 1, 10 and 16 meet the requirements of Article 33 PCT.

Claims 2 to 9, 11 to 15 and 17 are dependent claims and as such also meet the requirements of the PCT with respect to novelty and inventive step.

**Re Item VII**

**Certain defects in the international application**

A document reflecting the prior art described on page 3 or, at least, the document D1, is not identified in the description (Rule 5.1(a)(ii) PCT).

Enclosure of September 11, 2001

PCT Patent Application No.: PCT/EP99/04625  
NOKIA NETWORKS OY  
Our ref.: WO 24660

**New claims 1 to 17**

1. An authentication method for identifying a subscriber of a first network (2) in a second network, wherein an authentication server functionality for a VAS platform is provided, comprising the steps of:
  - 5 a) allocating an address of said second network (9) to said subscriber;
  - b) generating information about a mapping between the subscriber's address in said second network (9) and a subscriber identity; and
  - 10 c) transmitting the mapping to said second network, wherein said subscriber is identified in the VAS platform based on said mapping information.
2. An authentication method according to claim 1,  
15 wherein said mapping information is transmitted to said second network, when said mapping between said address in said second network and the subscriber identity has changed.
- 20 3. An authentication method according to claim 1 or 2, wherein said subscriber identity is an IMSI and/or an MSISDN of the subscriber.

- 2/4 -

4. An authentication method according to any one of claims 1 to 3, wherein said mapping information is transmitted in an access request message.
- 5 5. An authentication method according to claim 4, wherein said request access message is a RADIUS access request message.
6. An authentication method according to claim 1,  
10 wherein said authentication server functionality is included in the VAS platform.
7. An authentication method according to claim 1, wherein said authentication server functionality is  
15 provided by a dedicated authentication server.
8. An authentication method according to any one of the preceding claims, wherein said mapping information is generated by an authentication client functionality in a  
20 GGSN.
9. An authentication method according to any one of the preceding claims, wherein said mapping information is used for a service specific charging and/or addressing of  
25 mobile terminals.
10. An Authentication system for identifying a subscriber (1) of a first network (2) in a second network (9), comprising:
- 30 a) a gateway device (5) comprising allocation means (51) for allocating an address of said second network (9) to said subscriber (1), and authentication client means (52) for generating an information about a mapping between said address of said second network (9) and a

- 3/4 -

subscriber identity, and for transmitting said mapping information to said second network (9); and

b) an authentication server (8) provided in said second network (9) and adapted to log and maintain said mapping information

c) wherein said authentication server (8) is a server for a VAS platform (7) provided in said second network (9), wherein said VAS platform (7) is adapted to identify said subscriber (1) based on said mapping information.

10

11. An authentication system according to claim 10, wherein said gateway device is a GGSN (5).

12. An authentication system according to claim 10 or 11, wherein said authentication client means (52) is a RADIUS client.

13. An authentication system according to any one of claims 10 to 12, wherein said authentication server (8) is a RADIUS server.

14. An authentication system according to any one of claims 10 to 13, wherein said subscriber identity is an IMSI or an MSISDN.

25

15. An authentication system according to any one of claims 10 to 14, wherein said authentication client means (52) is arranged to transmit said mapping information in an access request message to said authentication server (8).

30

16. A gateway device for connecting a first network (2) to a second network (9), comprising:

- 4/4 -

- a) allocation means (51) for allocating an address of said second network (9) to a subscriber (1) of said first network (2); and
- 5 b) authentication client means (52) for generating an information about a mapping between said address of said second network (9) and a subscriber identity, and for transmitting said mapping information to said IP network (9), wherein said authentication client means
- 10 (52) is a RADIUS client.

17. A gateway device according to claim 16, wherein said authentication client means (52) is arranged to transmit said mapping information in an access request message.



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089 / 2399 - 0  
Tx 523 656 epmu d  
Fax 089 / 2399 - 4465

**EINGEGANGEN**  
Patentanwältin  
- 7. JULI 1999  
TIEDTKE - BÜHLING - KINNE  
& PARTNER

Europäisches  
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European  
Patent Office

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des brevets

EPA/EPO/OEB - D-80298 München

TRÖSCH, Hans-Ludwig  
Tiedtke-Bühling-Kinne et al.  
Bavariaring 4

D-80336 München

Nr. der Anmeldung / Application No. / Demande de brevet n°

PCT/EP 99 / 04625

Tag des Eingangs / Date of receipt / Date de réception

02.07.1999 (EASY)

Zeichen des Anmelders / Vertreters - Applicant / Representative  
ref. No. - Référence du demandeur ou du mandataire

WO 24660

Anmelder / Applicant / Demandeur : NOKIA TELECOMMUNICATIONS OY Datum / Date 05.07.1999

### Empfangsbescheinigung / Receipt for documents / Récépissé de documents

Das Europäische Patentamt bescheinigt hiermit den Empfang folgender Dokumente :

The European Patent Office hereby acknowledges the receipt of the following :

L'Office européen des brevets accuse réception des documents indiqués ci-dessous :

**A. Internationale Anmeldung / International application / Demande internationale**

Stückzahl / No. of  
copies / Nombre  
d'exemplaires

- ☒ Antrag / Request / Requête
- ☒ Beschreibung (ohne Sequenzprotokollteil)  
Description (excluding sequence listing part)  
Description (sauf partie réservée au listage  
des séquences)
- ☒ Patentansprüche / Claim(s) / Revendication(s)
- ☒ Zusammenfassung / Abstract / Abrégé
- ☒ Zeichnung(en) / Drawing(s) / Dessin(s)

☐ Sequenzprotokollteil der Beschreibung  
Sequence listing part of description  
Partie de la description réservée au listage  
des séquences

☐ Beigefügte Unterlagen / Accompanying  
items / Eléments joints

**B. Beigefügte Dokumente / Accompanying documents / Documents joints**

- ☒ Blatt für die Gebührenberechnung  
Fee calculation sheet  
Feuille de calcul des taxes
- ☐ Gesonderte unterzeichnete Vollmacht  
Separate signed power of attorney  
Pouvoir distinct signé

☐ Kopie der allgemeinen Vollmacht  
Copy of general power of attorney  
Copie du pouvoir général

☐ Prioritätsbeleg(e)  
Priority document(s)  
Document(s) de priorité

☐ Gesonderte Angaben zu hinterlegten  
Mikroorganismen oder anderem biologischen  
Material  
Separate indications concerning deposited micro-  
organism or other biological material  
Indications séparées concernant des micro-  
organismes ou autre matériel biologique déposés

☐ Protokoll der Nucleotid- und/oder  
Aminosäuresequenzen in computerlesbarer Form  
Nucleotide and/or amino acid sequence listing in  
computer readable form  
Listage des séquences de nucléotides ou d'acides  
aminés sous forme déchiffable par ordinateur

☐ Abbuchungsauftrag  
Debit order  
Ordre de débit

Währung/Currency/Monnaie  
Betrag/Amount/Montant

☐ Scheck  
Cheque  
Chèque

DM. 4465,12  
Ausfüllung freigestellt/  
Optional/facultatif

☒ Sonstige Unterlagen (einzeln aufführen)  
Other documents (specify)  
Autres documents (préciser)

Diskette

Die genannten Unterlagen sind am oben genannten Tag eingegangen. Die in der Kontrollliste (Feld VIII) des PCT-Antragsformulars RO/101 angegebenen Blattzahlen wurden bei Eingang nicht geprüft. Die Anmeldung hat die ebenfalls oben angeführte Anmeldenummer erhalten / The said items were received on the date indicated above. No check was made on receipt that the number of sheets indicated in the check list (box VIII) of the PCT Request Form RO/101 were correct. The application has been assigned the above indicated application number / Les documents mentionnés ont été reçus à la date indiquée. L'existence du nombre de feuilles indiqué au bordereau (cadre VIII) du formulaire de requête PCT RO/101 n'a pas été contrôlée lors du dépôt. L'application mentionnée ci-dessus a été attribuée à la demande de brevet

Europäisches Patentamt  
Office européen des brevets  
D-80298 München  
F. Telari

## PCT REQUEST

WO 24660

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<b>0</b>	<b>For receiving Office use only</b>	
<b>0-1</b>	International Application No.	
<b>0-2</b>	International Filing Date	
<b>0-3</b>	Name of receiving Office and "PCT International Application"	
<b>0-4</b>	<b>Form - PCT/RO/101 PCT Request</b>	
<b>0-4-1</b>	Prepared using	PCT-EASY Version 2.84 (updated 01.04.1999)
<b>0-5</b>	<b>Petition</b> The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
<b>0-6</b>	Receiving Office (specified by the applicant)	European Patent Office (EPO) (RO/EP)
<b>0-7</b>	Applicant's or agent's file reference	WO 24660
<b>I</b>	<b>Title of invention</b>	<b>AUTHENTICATION METHOD AND SYSTEM</b>
<b>II</b>	<b>Applicant</b>	
<b>II-1</b>	This person is:	applicant only
<b>II-2</b>	Applicant for	all designated States except US
<b>II-4</b>	Name	NOKIA TELECOMMUNICATIONS OY
<b>II-5</b>	Address:	Keilalahdentie 4 FIN-02150 Espoo Finland
<b>II-6</b>	State of nationality	FI
<b>II-7</b>	State of residence	FI
<b>II-8</b>	Telephone No.	+358 9 1807 0
<b>II-9</b>	Facsimile No.	+358 9 1807 496
<b>III-1</b>	<b>Applicant and/or inventor</b>	
<b>III-1-1</b>	This person is:	applicant and inventor
<b>III-1-2</b>	Applicant for	US only
<b>III-1-4</b>	Name (LAST, First)	VITIKAINEN, Timo
<b>III-1-5</b>	Address:	Sinitaiscnpolku 4A3 FIN-02660 Espoo Finland
<b>III-1-6</b>	State of nationality	FI
<b>III-1-7</b>	State of residence	FI

## PCT REQUEST

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IV-1	<b>Agent or common representative; or address for correspondence</b> The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	agent
IV-1-1	Name (LAST, First)	TRÖSCH, Hans-Ludwig
IV-1-2	Address:	Tiedtke-Bühling-Kinne et al. Bavariaring 4 D-80336 München Germany
IV-1-3	Telephone No.	+49 89 544690
IV-1-4	Facsimile No.	+49 89 532611
IV-1-5	e-mail	postoffice tbk-patent.com
IV-2	Additional agent(s)	additional agent(s) with same address as first named agent
IV-2-1	Name(s)	TIEDTKE, Harro; BÜHLING, Gerhard; KINNE, Reinhard; GRAMS, Klaus; LINK, Annette; VOLLNHALS, Aurel; LESON, Thomas, Johannes, Alois; PELLMANN, Hans-Bernd; CHIVAROV, Georgi; GRILL, Matthias; KÜHN, Alexander; OSER, Andreas; BÖCKELEN, Rainer
V	Designation of States	
V-1	Regional Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	AP: GH GM KE LS MW SD SZ UG ZW and any other State which is a Contracting State of the Harare Protocol and of the PCT EA: AM AZ BY KG KZ MD RU TJ TM and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT EP: AT BE CH&LI CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE and any other State which is a Contracting State of the European Patent Convention and of the PCT OA: BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG and any other State which is a member State of OAPI and a Contracting State of the PCT
V-2	National Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	AE AL AM AT AU AZ BA BB BG BR BY CA CH&LI CN CU CZ DE DK EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZA ZW



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V-5	<b>Precautionary Designation Statement</b> In addition to the designations made under items V-1, V-2 and V-3, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except any designation(s) of the State(s) indicated under item V-6 below. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit.		
V-6	<b>Exclusion(s) from precautionary designations</b>	NONE	
VI	<b>Priority claim</b>	NONE	
VII-1	<b>International Searching Authority Chosen</b>	European Patent Office (EPO) (ISA/EP)	
VIII	<b>Check list</b>	number of sheets	electronic file(s) attached
VIII-1	Request	4	-
VIII-2	Description	12	-
VIII-3	Claims	4	-
VIII-4	Abstract	1	wo24660a.txt
VIII-5	Drawings	2	-
VIII-7	TOTAL	23	
VIII-8	<b>Accompanying items</b>	paper document(s) attached	electronic file(s) attached
VIII-8	Fee calculation sheet	✓	-
VIII-16	PCT-EASY diskette	-	diskette
VIII-18	Figure of the drawings which should accompany the abstract	1	
VIII-19	Language of filing of the international application	English	
IX-1	Signature of applicant or agent		
IX-1-1	Name (LAST, First)	TRÖSCH, Hans-Ludwig	

## FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	
10-2	Drawings:	
10-2-1	Received	
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/EP
10-6	Transmittal of search copy delayed until search fee is paid	

**PCT REQUEST**

WO 24660

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**FOR INTERNATIONAL BUREAU USE ONLY**

11-1	Date of receipt of the record copy by the International Bureau	
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structural features of the claimed authentication system and gateway (gateway device, allocation means, authentication client means and authentication server) are not explicitly described in D1, a skilled person would without the exercise of inventive skill, utilize such structural features to carry out the steps of the method defined in claim 1. Claims 11 and 17 therefore do not meet the requirements of Article 33(3) PCT.

4. Dependent claims 2 to 4 and 18 do not contain any features which, in combination with the features of claim 1 or 17 to which they refer, meet the requirements of the PCT in respect of inventive step, these features being either disclosed in the prior art of D1 or D2, or being common measures. Therefore, claims 2 to 4 and 18 do not meet the requirements of Article 33(3) PCT.
5. It is considered that, in order for amended independent claims to meet the requirements laid down in Article 33 PCT, they should be drafted in less broad terms and in such a manner as to adhere more closely to the method and the system as disclosed in the description.

Independent claims should be drafted in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (document D1) being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

In order to facilitate the examination of the conformity of the amended application with the requirements of Article 34(2)(b) PCT, the applicant is requested to clearly identify the amendments carried out, no matter whether they concern amendments by addition, replacement or deletion, and to indicate the passages of the application as filed on which these amendments are based (see also Rule 66.8(a) PCT).

**Re Item VII**

**Certain defects in the international application**

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, nor is this document identified therein.
2. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

**Re Item VIII**

**Certain observations on the international application**

The formulation "generating an information about a mapping" used in claims 1, 11 and 17 is unclear and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claims unclear (Article 6 PCT).

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
11 January 2001 (11.01.2001)

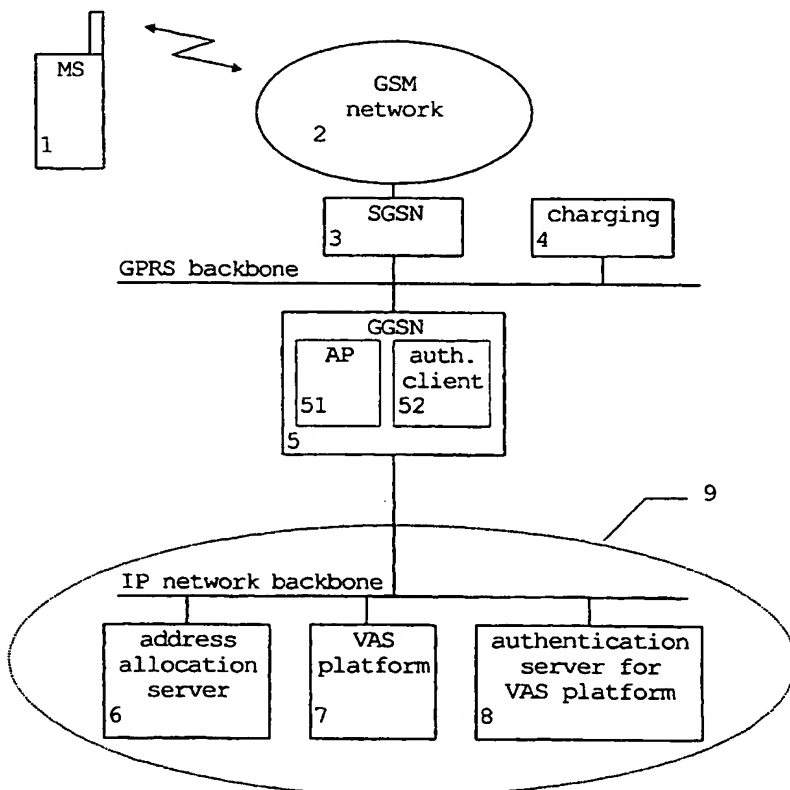
PCT

(10) International Publication Number  
**WO 01/03402 A1**

- (51) International Patent Classification<sup>7</sup>: **H04L 29/06, H04Q 7/38**
- (21) International Application Number: **PCT/EP99/04625**
- (22) International Filing Date: **2 July 1999 (02.07.1999)**
- (25) Filing Language: **English**
- (26) Publication Language: **English**
- (71) Applicant (for all designated States except US): **NOKIA COMMUNICATIONS OY [FI/FI]; Keilalahdentie 4, FIN-02150 Espoo (FI).**
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **VITIKAINEN, Timo [FI/FI]; Sinitaiscpolku 4A3, FIN-02660 Espoo (FI).**
- (74) Agents: **TRÖSCH, Hans-Ludwig et al.; Tiedtke-Bühling-Kinne et al., Bavariaring 4, D-80336 München (DE).**
- (81) Designated States (national): **AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW.**
- (84) Designated States (regional): **ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).**
- Published:  
— With international search report.

[Continued on next page]

(54) Title: **AUTHENTICATION METHOD AND SYSTEM**



(57) Abstract: The present invention relates to an authentication method and system for identifying a subscriber (1) of a first network (2) in a second network (9), wherein an address of the second network (9) is allocated to the subscriber (1). An information about a mapping between the address of the second network (9) and a subscriber identity is generated and transmitted to the second network (9). Thereby, an authentication server connection is provided between the first network (2) and the second network (9), such that the subscriber identity can be handled over to the second network (9). Thus, a VAS platform of the second network (9) can receive the address of the second network and the subscriber identity of the subscriber (1), such that subscriber accessing services of the VAS platform can be identified for charging and/or addressing purposes.

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WO 01/03402 A1

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

- 1 -

**Authentication method and system**FIELD OF THE INVENTION

5 The present invention relates to an authentication method and system for identifying a subscriber of a first network in a second network.

BACKGROUND OF THE INVENTION

10

In a GPRS (General Packet Radio Services) system, a packet mode technique is used to transfer high-speed and low-speed data and signaling in an efficient manner. GPRS optimizes the use of network and radio resources. Applications based on standard data protocols are supported, and interworking is defined with IP-networks. GPRS is designed to support from intermittent and bursty data transfers through to occasional transmission of large volumes of data. Charging is typically based on the amount of data transferred.

20

GPRS introduces two new network nodes in the GSM mobile network. The Serving GPRS Support Node (SGSN) which is at the same hierarchical level as a mobile switching center (MSC) and which keeps track of the individual location of mobile stations (MS) and performs security functions and access control. The SGSN is connected to the base station system with a Frame Relay. The Gateway GSN (GGSN) provides interworking with external packet-switched networks, and is connected with SGSNs via an IP-based GPRS backbone network.

25

30 A HLR (Home Location Register) of the GSM system is enhanced with GPRS subscriber information, and a VLR (Visitor Location Register) can be enhanced for more efficient coordination of GPRS and non-GPRS services and functionality, e.g. paging for circuit switched calls that

- 2 -

can be performed more efficiently via the SGSN, and combined GPRS and non-GPRS location updates.

In order to access the GPRS services, an MS first makes its  
5 presence known to the network by performing a GPRS attach. This operation establishes a logical link between the MS and SGSN, and makes the MS available for paging via the SGSN, and notification of incoming GPRS data. In order to  
10 send and receive GPRS data, the MS shall activate the packet data address it wants to use. This operation makes the MS known in the corresponding GGSN and interworking with external data networks can commence. User data is transferred transparently between the MS and the external  
15 data networks with a method known as capsulating and tunneling, wherein data packets are equipped with GPRS-specific protocol information and transferred between the MS and the GGSN. This transparent transfer method lessens the requirement for the GPRS mobile network to interpret external data protocols, and it enables easy introduction  
20 of additional interworking protocols in the future.

In case a mobile subscriber wishes to access a value added service (VAS) provided by an IP network, a service specific charging is a mandatory feature of the corresponding VAS  
25 platform for mobile operators. This means that operators need service platforms which are capable of performing charging based on e.g. an accessed WML content or URL (Uniform Resource Locator) and delivered messages. However, MS identification in VAS platforms connected to the GPRS  
30 network or other mobile packet switched networks is not trivial. The reason therefore is that a VAS platform receives only IP packets from a certain source address which is normally only a dynamic IP address of an MS and thus not sufficient at all for identifying that MS.



- 3 -

Furthermore, an MSISDN (Mobile Station ISDN number) is required which is especially important for messaging services (e.g. multimedia messaging) in order to prevent additional HLR queries.

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A known MS identification is performed e.g. by using user names, passwords or cryptographic keys. However, these types of solutions are complex to operate/manage for mobile operators. Moreover, such solutions normally require their own management systems and data bases which are not necessarily consistent with existing billing or charging systems of mobile operators where the IMSI (International Mobile Subscriber Identity) or the MSISDN are the key of the CDRs (Call Detail Records).

15

Alternatively, an authentication service could be performed in the HLR. However, this solution leads to a significant rise of the load in the HLR which is already a crucial node.

20

#### SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide an authentication method and system, by means of which VAS platforms may identify an MS accessing services of the VAS platform.

25

This object is achieved by an authentication method for identifying a subscriber of a first network in a second network, comprising the steps of:  
allocating an address of said second network to said subscriber;

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- 4 -

generating information about a mapping between the subscriber's address in said second network and a subscriber identity; and transmitting the mapping to said second network.

5

Furthermore, the above object is achieved by Authentication system for identifying a subscriber of a first network in a second network, comprising:

a gateway device comprising allocation means for allocating  
10 an address of said second network to said subscriber, and authentication client means for generating an information about a mapping between said address of said second network and a subscriber identity, and for transmitting said mapping information to said second network; and  
15 an authentication server provided in said second network and adapted to log and maintain said mapping information.

Furthermore, the above object is achieved by a gateway device for connecting a first network to a second network,  
20 comprising:

allocation means for allocating an address of said second network to a subscriber of said first network; and authentication client means for generating an information about a mapping between said address of said second network  
25 and a subscriber identity, and for transmitting said mapping information to said IP network.

Accordingly, a mapping information between the address of the second network and the subscriber identity is generated  
30 and supplied to the second network. Thereby, a client-server connection is achieved, which allows the actual subscriber identity of a dynamic address of the second network to be handled over to the second network. The

- 5 -

second network uses the mapping of the address of the second network and the subscriber identity for identifying the subscriber.

5 Since the first network, e.g. the GGSN, includes an information about the mapping between the address of the second network and the subscriber identity, new mapping data can be transmitted to the second network, if the mapping has changed.

10

Preferably, the subscriber identity is the IMSI and/or the MSISDN of the subscriber. Thereby, a multimedia messaging service may identify the recipient using the MSISDN, and the recipient may identify the message sender based on the MSISDN provided by the multimedia messaging service center, such that HLR queries are no longer required. Furthermore, the MSISDN or IMSI may be used by a charging function for identifying the subscriber in order to perform a service specific charging.

20

The mapping information may be transmitted in an access request message, such as a RADIUS access request message.

Preferably, an authentication server functionality may be provided for a VAS platform, wherein the access request message is transmitted to the authentication server functionality of the VAS platform, and the mobile terminal is identified in the VAS platform based on the mapping information. In this case, the authentication server functionality may be included in the VAS platform or, alternatively, the authentication server functionality may be provided by a dedicated authentication server.

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- 6 -

In case the gateway device is a GGSN, the mapping information may be generated by an authentication client functionality in the GGSN.

- 5 The mapping information may be used for a service specific charging.

The authentication server may be a RADIUS server for the VAS platform provided in the second network, wherein the  
10 VAS platform is adapted to identify the subscriber based on the mapping information.

#### BRIEF DESCRIPTION OF THE DRAWINGS

- 15 In the following, the present invention will be described in greater detail on the basis of a preferred embodiment with reference to the accompanying drawings, in which:

Fig. 1 shows a block diagram of a GPRS network connected to  
20 an IP network according to the preferred embodiment of the present invention, and

Fig. 2 shows an information flow and processing diagram of an access operation to the IP network, according to the  
25 preferred embodiment of the present invention.

#### DESCRIPTION OF THE PREFERRED EMBODIMENT

- 30 In the following, the preferred embodiment of the authentication method and system according to the present invention will be described on the basis of a GPRS network which is an example for a first network and an IP network which is an example for a second network.

- 7 -

According to Fig. 1, a mobile terminal or mobile station (MS) 1 is radio-connected to a GSM network 2 which in turn is connected to an SGSN 3 of a GPRS backbone network. The GPRS backbone network includes a charging server 4 and a GGSN 5 connected to an IP network 9, e.g. an intranet of a specific operator or the Internet.

The GGSN 5 comprises an access point unit (AP) 51 which provides an access to the IP network 9 and which is arranged to allocate an IP address to an MS to be connected to the IP network 9. Furthermore, the GGSN 5 includes an authentication client unit 52 adapted to provide required parameters for an access request issued to the IP network 9. Moreover, the authentication client unit 52 may be arranged to clarify/specify the handling of user name and password parameters supplied to the desired VAS of the IP network 9.

According to an example of the preferred embodiment shown in Fig. 1, the IP network 9 is an operator's intranet backbone which comprises an address allocation server 6, e.g. a RADIUS (Remote Authentication Dial In User Service) server, a DHCP (Dynamic Host Configuration Protocol) server or a DNS (Domain Name Server), or the like. The address allocation server 6 is arranged to respond to an access request from the GGSN 5 with either an access-accept or an access-reject message. Furthermore, the address allocation server 6 performs a host configuration and address allocation in the IP network 9.

Additionally, the IP network 9, e.g. the operator's intranet, comprises a Value Added Service (VAS) platform 7. An example for such a VAS platform may be a Multimedia

- 8 -

Messaging Center (MMSC) for delivering multimedia messages to requesting subscribers such as the MS 1. Moreover, another example for a VAS platform is a Wireless Application Protocol (WAP) gateway which provides an access  
5 to the World Wide Web (WWW) based on a corresponding Uniform Resource Locator (URL).

According to the preferred embodiment of the present invention, a dedicated authentication server 8 for the VAS  
10 platform 7 is provided in the IP network 9. The authentication server 8 may be a RADIUS server which accepts or rejects access requests to the VAS platform 7. Furthermore, the authentication server 8 is arranged to log or store an access request or a corresponding mobile  
15 subscriber identity, received from the authentication client, e.g. RADIUS client, 52 of the GGSN 5. Accordingly, the authentication client 52 of the GGSN 5 communicates with the address allocation server or specific authentication server 8, such that an authentication  
20 client-server connection is established.

In particular, the authentication client 52 incorporates or adds a mapping information to the access request, based on which the actual MSISDN and/or IMSI of an MS requesting a  
25 service from the IP network 9 can be derived at the authentication server 8. The mapping information may comprise the current IP address, the MSISDN and/or the IMSI, or any combination or shortened version, based on which the MSISDN and/or IMSI can be derived from the  
30 current IP address. The MSISDN can be obtained by the GGSN 5 via the SGSN 3 from GSM network 2.

Thus, the authentication client unit 52 of the GGSN 5 provides an information about the mapping between the IP

- 9 -

address and the MSISDN and/or the IMSI. If this mapping is changed, the authentication client unit 52 sends a new mapping information to the authentication server 8 of the IP network 9. Thereby, the MSISDN and/or IMSI is always  
5 available to the VAS platform 7.

The MSISDN can be provided as an additional GTP parameter supplied from the SGSN 3 to the GGSN 5. The IMSI can be derived from the TID also supplied from the SGSN 3 to the  
10 GGSN 5.

The GGSN 5 functions as an access point of the GSM GPRS data network for interworking with the IP network 9. In this case, the GPRS network will look like any other IP  
15 network or subnetwork. The access to the IP network 9 may involve specific functions such as user authentication, users authorization, end-to-end encryption between an MS and the IP network 9, allocation of a dynamic IP address belonging to the addressing space of the IP network 9. In  
20 case of a non-transparent access to the IP network 9, the GGSN 5 takes part in the functions listed above. In particular, the MS 1 requesting access to the IP network 9 is given an address belonging to the operator addressing space. The address is given either at subscription, in  
25 which case it is a static address, or at PDP (Packet Data Protocol) context activation, in which case it is a dynamic address. This address is used for packet forwarding between the IP network 9 and the GGSN 5 and within the GGSN 5.

30 In the following, an example for an access operation to the IP network 9 via the GPRS backbone network is described based on Fig. 2.

- 10 -

Fig. 2 shows an information flow and processing diagram indicating the signaling and processing actions performed during the exemplary access operation. According to Fig. 2, the MS 1 sends an Activate PDP Context Request message to the SGSN 3, including protocol configuration options and parameters such as an NSAPI (Network layer Service Access Point Identifier). Then, the SGSN 3 creates a TID for the requested PDP context by combining the IMSI stored in the MM (Mobility Management) context with the MSAPI received from the MS, wherein the SGSN fetches the MSISDN from the HLR. Subsequently, the SGSN 3 transmits a Create PDP Context Request message to the GGSN 5 including parameters such as an APN (Access Point Name), the TID and the MSISDN. The AP unit 51 of the GGSN 5 allocates an IP address for the MS 1, and the authentication client unit 52 incorporates required parameters for the access request to the authentication server 8. In particular, the authentication client unit 52 generates mapping data indicating a mapping between the allocated IP address and the MSISDN/IMSI.

The GGSN 5 sends the access request including the IP address and the mapping data to the authentication server 8 provided for the VAS platform 7. Then, the authentication server 8 accepts or rejects the received request. Furthermore, the authentication server 8 logs the request including the IP address and the mapping data. Accordingly, the VAS platform 7 is capable of identifying the MS 1 based on the mapping data included in the access request stored in the authentication server 8.

The GGSN 5 sends back to the SGSN 3 a Create PDP Context Response message, wherein a cause value is set according to the result of the authentication, i.e. access rejected or



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accepted. Depending on the cause value received in the Create PDP Context Response message, the SGSN 3 sends either an Activate PDP Context Accept message or an Activate PDP Context Reject message to the MS 1.

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Accordingly, by the above access procedure, the VAS platform 7 can receive the IP address, the IMSI and the MSISDN of an accessing MS, such that the addressing in the multimedia messaging service can be based on the MSISDN and service specific charging is possible.

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In summary, the present invention relates to an authentication method and system for identifying a subscriber of a first network in a second network, wherein an address of the second network is allocated to the subscriber. An information about a mapping between the address of the second network and a subscriber identity is generated and transmitted to the second network. Thereby, an authentication server connection is provided between the first network and the second network, such that the subscriber identity can be handled over to the second network. Thus, a VAS platform of the second network can receive the address of the second network and the subscriber identity of the subscriber, such that subscriber accessing services of the VAS platform can be identified for charging and/or addressing purposes.

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It is to be noted that the above described authentication method and system can be applied between any gateway device between two networks, such as a mobile network and an IP network, or a telephone network (e.g., ISDN, PSTN) and a closed or open data network. Moreover, the authentication server 8 and authentication client unit 52 are not

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restricted to a RADIUS server and client. It is also to be noted that multiple VAS platforms, similar to or different from each other, can be attached to the second network at the same time.

5

The above description of the preferred embodiment and the accompanying drawings are only intended to illustrate the present invention. The preferred embodiment of the invention may thus vary within the scope of the attaches

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claims.

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### Claims

- 5 1. An authentication method for identifying a subscriber of a first network (2) in a second network, comprising the steps of:
- a) allocating an address of said second network (9) to said subscriber;
- 10 b) generating information about a mapping between the subscriber's address in said second network (9) and a subscriber identity; and
- c) transmitting the mapping to said second network.
- 15 2. An authentication method according to claim 1, wherein said mapping information is transmitted to said second network, when said mapping between said address in said second network and the subscriber identity has changed.
- 20 3. An authentication method according to claim 1 or 2, wherein said subscriber identity is an IMSI and/or an MSISDN of the subscriber.
4. An authentication method according to any one of claims 1 to 3, wherein said mapping information is transmitted in
- 25 an access request message.
5. An authentication method according to claim 4, wherein said request access message is a RADIUS access request
- 30 message.
6. An authentication method according to claim 4 or 5, further comprising the steps of providing an authentication

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server functionality for a VAS platform, transmitting said access request message to said authentication server functionality, and identifying said subscriber in the VAS platform based on said mapping information.

5

7. An authentication method according to claim 6, wherein said authentication server functionality is included in the VAS platform.

10 8. An authentication method according to claim 6, wherein said authentication server functionality is provided by a dedicated authentication server.

15 9. An authentication method according to any one of the preceding claims, wherein said mapping information is generated by an authentication client functionality in a GGSN.

20 10. An authentication method according to any one of the preceding claims, wherein said mapping information is used for a service specific charging and/or addressing of mobile terminals.

25 11. An Authentication system for identifying a subscriber (1) of a first network (2) in a second network (9), comprising:

a) a gateway device (5) comprising allocation means (51) for allocating an address of said second network (9) to said subscriber (1), and authentication client means (52)  
30 for generating an information about a mapping between said address of said second network (9) and a subscriber identity, and for transmitting said mapping information to said second network (9); and

- 15 -

b) an authentication server (8) provided in said second network (9) and adapted to log and maintain said mapping information.

5 12. An authentication system according to claim 11, wherein said gateway device is a GGSN (5).

13. An authentication system according to claim 11 or 12, wherein said authentication client means (52) is a RADIUS  
10 client.

14. An authentication system according to any one of claims 11 to 13, wherein said authentication server (8) is a RADIUS server for a VAS platform (7) provided in said  
15 second network (9), wherein said VAS platform (7) is adapted to identify said subscriber (1) based on said mapping information.

15. An authentication system according to any one of claims  
20 11 to 14, wherein said subscriber identity is an IMSI or an MSISDN.

16. An authentication system according to any one of claims 11 to 15, wherein said authentication client means (52) is  
25 arranged to transmit said mapping information in an access request message to said authentication server (8).

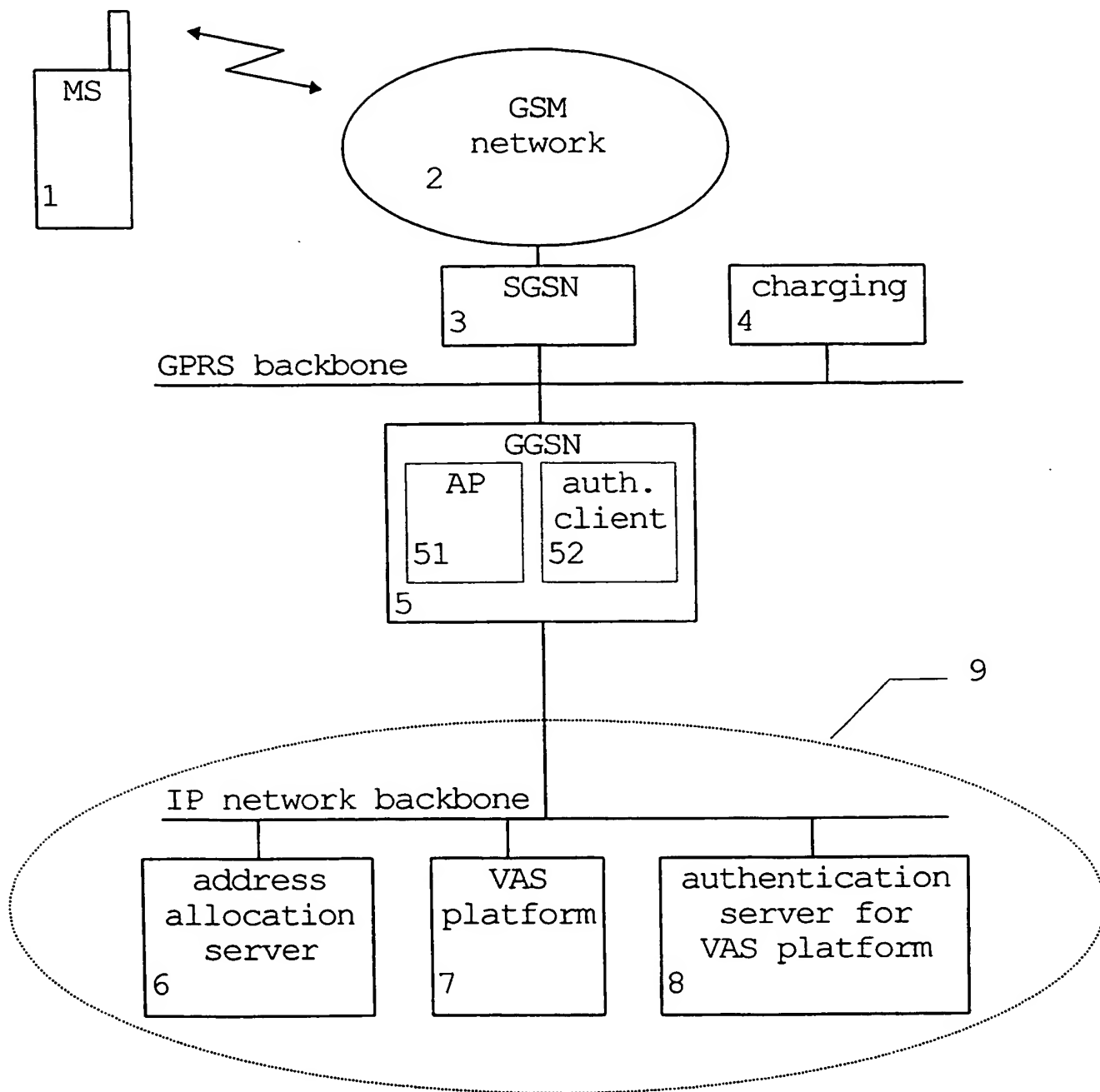
17. A gateway device for connecting a first network (2) to a second network (9), comprising:  
30 a) allocation means (51) for allocating an address of said second network (9) to a subscriber (1) of said first network (2); and

- 16 -

b) authentication client means (52) for generating an information about a mapping between said address of said second network (9) and a subscriber identity, and for transmitting said mapping information to said IP network (9).

5

18. A gateway device according to claim 17, wherein said authentication client means (52) is arranged to transmit said mapping information in an access request message.

**Fig. 1**

2 / 2

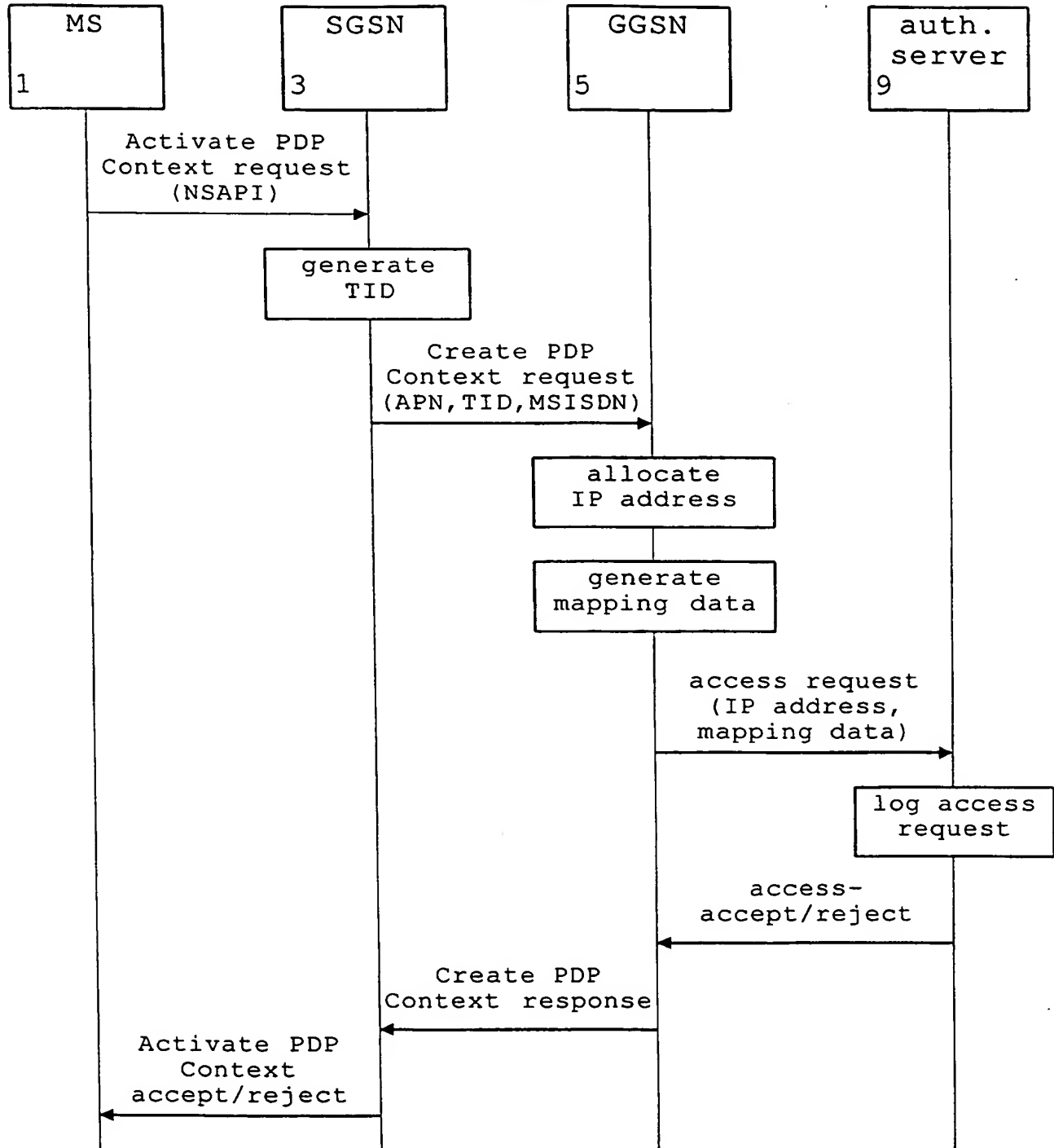


Fig. 2



TBK

TIEDTKE - BÜHLING - KINNE & PARTNER (GbR)



TBK-Patent POB 20 19 18 80019 München

An das  
Europäische Patentamt

80298 München

Patentanwälte

Dipl.-Ing. Harro Tiedtke  
Dipl.-Ing. Reinhard Kinne  
Dipl.-Ing. Hans-Bernd Pellmann  
Dipl.-Ing. Klaus Grams  
Dipl.-Ing. Aurel Vollnhals  
Dipl.-Ing. Thomas J.A. Leson  
Dipl.-Ing. Dr. Georgi Chivarov  
Dipl.-Ing. Matthias Grill  
Dipl.-Ing. Hans-Ludwig Trösch  
Dipl.-Ing. Alexander Kühn  
Dipl.-Ing. Rainer Böckelen  
Dipl.-Ing. Stefan Klingele  
Dipl.-Chem. Stefan Bühling  
Dipl.-Ing. Ronald Roth

September 11, 2001

PCT Patent Application No.: PCT/EP99/04625

NOKIA NETWORKS OY

Our ref.: WO 24660

(F: 11.9.01, Eing.)

Reference is made to the Written Opinion pursuant to Rule  
66 PCT dated July 11, 2001.

Enclosed new claims 1 to 17 replacing the original claims 1  
to 18 are filed, upon which the further prosecution of the  
application is to be based.

It is intended to effect necessary amendments to the  
description in the regional/national phase. It is kindly  
requested to agree to such course of action.

The new independent claim 1 is based on the original  
independent claim 1 and the original dependent claim 6. The  
new independent claim 10 is based on the original  
independent claim 11 and the original dependent claim 14.  
The new independent claim 16 is based on the original  
independent claim 16, wherein the additional feature of the  
RADIUS client is disclosed in the original dependent claim  
13, for example.

The new dependent claims 2 to 5 correspond to the original  
dependent claims 2 to 5, and the new dependent claims 6 to

Dresdner Bank München Kto. 3939 844 BLZ 700 800 00  
Deutsche Bank München Kto. 286 1060 BLZ 700 700 10  
Postbank München Kto. 67043 804 BLZ 700 100 80  
Dai-ichi-Kangyo Bank München Kto. 8104233007 BLZ 300 207 00  
Sanwa Bank Düsseldorf Kto. 500 047 BLZ 301 307 00

Telefon: +49 89 544690  
Telefax (G3): +49 89 532611  
Telefax (G3+G4): +49 89 5329095  
E-Mail: postoffice@tbk-patent.de  
Internet: <http://www.tbk-patent.de>  
Bavariaring 4-6, 80336 München

9 correspond to the original dependent claims 7 to 10, respectively. The new dependent claims 11 to 15 and 17 are based on the original dependent claims 12 to 16 and 18, respectively.

The new independent claims 1, 10 and 16 are formulated in the one-part form since it is believed that a two-part form would lead to a complicated claim wording.

As can be taken from the wording of the new independent claims 1, 10 and 17, the subject-matter of the claims was concretized such that the authentication and VAS platform functionality is described in the claims. Thus, with respect to the new independent claims, it is considered that the prior art as described in the introductory part of the present application represents the closest prior art.

That is, according to the prior art it is difficult to identify a subscriber to a first network in a second network. The known approaches involve complex operations and management, such as using user names, passwords or cryptographic keys. In particular, these solutions require an own management system. Moreover, an authentication service could be performed in the HLR. However, this solution would increase the already high load on this node.

Thus, the object underlying the present invention resides in providing an authentication method and system by means of which VAS platform may identify an MS accessing services.

This object is solved by an authentication method as set out in the new independent claim 1, an authentication system as set out in the new independent claim 10, and by a gateway device as set out in the new independent claim 16.

In detail, a subscriber of a subscriber to a first network is allocated an address of a second network, which comprises an authentication server functionality for a VAS platform. Information about a mapping between the subscriber's address in the second network and the subscriber identity is generated and sent to the second network. In the VAS platform, the subscriber is identified based on the mapping information. As to the independent claim 16 it is noted that the authentication client means of the gateway device is a RADIUS client which is adapted to forward, e.g., access requests to the VAS platform.

Thus, the VAS platform can easily and reliably identify the subscriber based on the mapping information. That is, no additional user names, password or cryptographic keys or the like are required which would otherwise need complex operations and management.

Document GB-A-2 280 085 (document D1) discloses a method for operating a telephone system, wherein local subscribers are identified by subscriber identification numbers. For non-local subscribers similar identification numbers are provided.

However, document D1 is fully silent regarding authentication server functionality or VAS. That is, document D1 does not even address the problem underlying the present application. Hence, document D1 can also not suggest the solution as defined in the new independent claims.

Therefore, a person skilled in the art could not have been inspired by document D1 such that the subject-matter of the new independent claims 1 and 10 and 16 would have become obvious to him without involving an inventive activity.

Document WO 95/32592 (document D2) also discloses basically a standard GSM system, and is fully silent regarding authentication in connection with VAS and the like. Hence, a person skilled in the art could not get any suggestions from document D2 which would lead him to the subject-matter of the new independent claims without involving an inventive activity.

Moreover, also a combination of the documents D1 and D2 could not lead a person skilled in the art to the subject-matter of the independent claims, since none of the documents describe authentication in connection with VAS and/or the problems related thereto.

Thus, it is respectfully submitted that the new independent claims 1, 10 and 16 show a patentable subject-matter.

The International Preliminary Examination Authority is therefore respectfully invited to reconsider its opinion on the patentability of the claimed subject matter in the light of the arguments as presented herein above prior to establishing the (final) International Preliminary Examination Report.

Thomas J.A. Leson  
Patentanwalt  
**TBK-Patent**

Enclosure:  
- New claims 1 to 17

Enclosure of September 11, 2001

PCT Patent Application No.: PCT/EP99/04625  
NOKIA NETWORKS OY  
Our ref.: WO 24660

**New claims 1 to 17**

---

1. An authentication method for identifying a subscriber of a first network (2) in a second network, wherein an authentication server functionality for a VAS platform is provided, comprising the steps of:
  - 5 a) allocating an address of said second network (9) to said subscriber;
  - b) generating information about a mapping between the subscriber's address in said second network (9) and a subscriber identity; and
  - 10 c) transmitting the mapping to said second network, wherein said subscriber is identified in the VAS platform based on said mapping information.
- 15 2. An authentication method according to claim 1, wherein said mapping information is transmitted to said second network, when said mapping between said address in said second network and the subscriber identity has changed.
- 20 3. An authentication method according to claim 1 or 2, wherein said subscriber identity is an IMSI and/or an MSISDN of the subscriber.

4. An authentication method according to any one of claims 1 to 3, wherein said mapping information is transmitted in an access request message.
- 5 5. An authentication method according to claim 4, wherein said request access message is a RADIUS access request message.
6. An authentication method according to claim 1,  
10 wherein said authentication server functionality is included in the VAS platform.
7. An authentication method according to claim 1, wherein said authentication server functionality is  
15 provided by a dedicated authentication server.
8. An authentication method according to any one of the preceding claims, wherein said mapping information is generated by an authentication client functionality in a  
20 GGSN.
9. An authentication method according to any one of the preceding claims, wherein said mapping information is used for a service specific charging and/or addressing of  
25 mobile terminals.
10. An Authentication system for identifying a subscriber  
(1) of a first network (2) in a second network (9), comprising:  
30 a) a gateway device (5) comprising allocation means (51) for allocating an address of said second network (9) to said subscriber (1), and authentication client means (52) for generating an information about a mapping between said address of said second network (9) and a

subscriber identity, and for transmitting said mapping information to said second network (9); and

b) an authentication server (8) provided in said second network (9) and adapted to log and maintain said

5 mapping information

c) wherein said authentication server (8) is a server for a VAS platform (7) provided in said second network (9), wherein said VAS platform (7) is adapted to identify said subscriber (1) based on said mapping information.

10

11. An authentication system according to claim 10, wherein said gateway device is a GGSN (5).

12. An authentication system according to claim 10 or 11, 15 wherein said authentication client means (52) is a RADIUS client.

13. An authentication system according to any one of claims 10 to 12, wherein said authentication server (8) 20 is a RADIUS server.

14. An authentication system according to any one of claims 10 to 13, wherein said subscriber identity is an IMSI or an MSISDN.

25

15. An authentication system according to any one of claims 10 to 14, wherein said authentication client means (52) is arranged to transmit said mapping information in an access request message to said authentication server 30 (8).

16. A gateway device for connecting a first network (2) to a second network (9), comprising:

a) allocation means (51) for allocating an address of said second network (9) to a subscriber (1) of said first network (2); and

5 b) authentication client means (52) for generating an information about a mapping between said address of said second network (9) and a subscriber identity, and for transmitting said mapping information to said IP network (9), wherein said authentication client means (52) is a RADIUS client.

10

17. A gateway device according to claim 16, wherein said authentication client means (52) is arranged to transmit said mapping information in an access request message.



## PATENT COOPERATION TREATY

PCT

INFORMATION CONCERNING ELECTED  
OFFICES NOTIFIED OF THEIR ELECTION

(PCT Rule 61.3)

From the INTERNATIONAL BUREAU

To:

LESON, Thomas, Johannes, Alois  
Tiedtke-Bühling-Kinne & Partner GbR  
TBK-Patent  
Bavariaring 4  
80336 München  
ALLEMAGNE

EINGEGANGEN  
Patentanwälte

- 5. April 2001

TIEDTKE · BÜHLING · KINNE  
& PARTNER (GbR)

Date of mailing (day/month/year)

26 March 2001 (26.03.01)

Applicant's or agent's file reference

WO 24660

## IMPORTANT INFORMATION

International application No.

PCT/EP99/04625

International filing date (day/month/year)

02 July 1999 (02.07.99)

Priority date (day/month/year)

Applicant

NOKIA COMMUNICATIONS OY et al

1. The applicant is hereby informed that the International Bureau has, according to Article 31(7), notified each of the following Offices of its election:

AP : GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW

EP : AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

National : AU, BG, CA, CN, CZ, DE, IL, JP, KP, KR, MN, NO, NZ, PL, RO, RU, SE, SK, US

2. The following Offices have waived the requirement for the notification of their election; the notification will be sent to them by the International Bureau only upon their request:

EA : AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

OA : BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

National : AE, AL, AM, AT, AZ, BA, BB, BR, BY, CH, CU, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR,  
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TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW

3. The applicant is reminded that he must enter the "national phase" before the expiration of 30 months from the priority date before each of the Offices listed above. This must be done by paying the national fee(s) and furnishing, if prescribed, a translation of the international application (Article 39(1)(a)), as well as, where applicable, by furnishing a translation of any annexes of the international preliminary examination report (Article 36(3)(b) and Rule 74.1).

Some offices have fixed time limits expiring later than the above-mentioned time limit. For detailed information about the applicable time limits and the acts to be performed upon entry into the national phase before a particular Office, see Volume II of the PCT Applicant's Guide.

The entry into the European regional phase is postponed until 31 months from the priority date for all States designated for the purposes of obtaining a European patent.

The International Bureau of WIPO  
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1211 Geneva 20, Switzerland

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Authorized officer:

Claudio Borton

Telephone No. (41-22) 338.83.38

## PATENT COOPERATION TREATY

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NOTIFICATION OF THE RECORDING  
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To:

TRÖSCH, Hans-Ludwig  
Tiedtke-Bühling-Kinne et al.  
Bavariaring 4  
D-80336 München  
ALLEMAGNE

Date of mailing (day/month/year) 20 February 2002 (20.02.02)	<b>IMPORTANT NOTIFICATION</b>
Applicant's or agent's file reference WO 24660	
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Name and Address NOKIA COMMUNICATIONS OY Keilalahdentie 4 FIN-02150 Espoo Finland	State of Nationality FI	State of Residence FI
	Telephone No. +358 9 1807 0	
	Facsimile No. +358 9 1807 496	
	Teleprinter No.	
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Name and Address NOKIA CORPORATION Keilalahdentie 4 FIN-02150 Espoo Finland	State of Nationality FI	State of Residence FI
	Telephone No. +358 9 1807 0	
	Facsimile No. +358 9 1807 496	
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The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer  Alexandre BOUVIER
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

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## Claims

- 5 1. An authentication method for identifying a subscriber of a first network (2) in a second network, comprising the steps of:
- a) allocating an address of said second network (9) to said subscriber;
- 10 b) generating information about a mapping between the subscriber's address in said second network (9) and a subscriber identity; and
- c) transmitting the mapping to said second network.
- 15 2. An authentication method according to claim 1, wherein said mapping information is transmitted to said second network, when said mapping between said address in said second network and the subscriber identity has changed.
- 20 3. An authentication method according to claim 1 or 2, wherein said subscriber identity is an IMSI and/or an MSISDN of the subscriber.
4. An authentication method according to any one of claims
- 25 1 to 3, wherein said mapping information is transmitted in an access request message.
5. An authentication method according to claim 4, wherein said request access message is a RADIUS access request
- 30 message.
6. An authentication method according to claim 4 or 5, further comprising the steps of providing an authentication

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server functionality for a VAS platform, transmitting said access request message to said authentication server functionality, and identifying said subscriber in the VAS platform based on said mapping information.

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7. An authentication method according to claim 6, wherein said authentication server functionality is included in the VAS platform.

10 8. An authentication method according to claim 6, wherein said authentication server functionality is provided by a dedicated authentication server.

15 9. An authentication method according to any one of the preceding claims, wherein said mapping information is generated by an authentication client functionality in a GGSN.

20 10. An authentication method according to any one of the preceding claims, wherein said mapping information is used for a service specific charging and/or addressing of mobile terminals.

25 11. An Authentication system for identifying a subscriber (1) of a first network (2) in a second network (9), comprising:

30 a) a gateway device (5) comprising allocation means (51) for allocating an address of said second network (9) to said subscriber (1), and authentication client means (52) for generating an information about a mapping between said address of said second network (9) and a subscriber identity, and for transmitting said mapping information to said second network (9); and

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b) an authentication server (8) provided in said second network (9) and adapted to log and maintain said mapping information.

5 12. An authentication system according to claim 11, wherein said gateway device is a GGSN (5).

10 13. An authentication system according to claim 11 or 12, wherein said authentication client means (52) is a RADIUS client.

15 14. An authentication system according to any one of claims 11 to 13, wherein said authentication server (8) is a RADIUS server for a VAS platform (7) provided in said second network (9), wherein said VAS platform (7) is adapted to identify said subscriber (1) based on said mapping information.

20 15. An authentication system according to any one of claims 11 to 14, wherein said subscriber identity is an IMSI or an MSISDN.

25 16. An authentication system according to any one of claims 11 to 15, wherein said authentication client means (52) is arranged to transmit said mapping information in an access request message to said authentication server (8).

17. A gateway device for connecting a first network (2) to a second network (9), comprising:  
30 a) allocation means (51) for allocating an address of said second network (9) to a subscriber (1) of said first network (2); and

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- b) authentication client means (52) for generating an information about a mapping between said address of said second network (9) and a subscriber identity, and for transmitting said mapping information to said IP network (9).
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18. A gateway device according to claim 17, wherein said authentication client means (52) is arranged to transmit said mapping information in an access request message.

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